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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/143,379

08/28/1998

R. RAO KOGANTY

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08/25/2006

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EXAMINER

WESSENDORF, TERESA D

ART UNIT

PAPER NUMBER

1639

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/143,379

Applicant(s)

KOGANTY ET AL.

Examiner

T. D. Wessendorf

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 30-33 and 38-82 is/are pending in the application.
- 4a) Of the above claim(s) 30,31,38-41,43,47,48,51-54,56-59 and 68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 32,33,42,44-46,49,50,55,60-67 and 69-82 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/22/2004 has been entered.

***Election/Restrictions***

Applicant's election with traverse of Group V, claims 30-33, 42-50 and 55-82 in the reply filed on 10/19/2005 is acknowledged. The traversal is on the ground(s) that the main claim 45 of Group V is allowable and hence dependent method of use claims 38-41 and 51-54 should be rejoined pursuant to MPEP 821.04. This is not found persuasive because there is no indication that the product claim has been allowed. Hence, the arguments that the inventions be rejoined are premature. Claims to the non-elected inventions are therefore withdrawn.

The requirement is still deemed proper and is therefore made FINAL.

Applicants' election made on 10/19/2005 of the following species: A) GalNac; B). core peptide mucin sequence, Seq. ID.1 (16 a.a.);C) mucin fragment (16 a.a. of page 11, line 18; D). 32 different peptides as in claims 55-16(sic); E). Five(5). Applicants traverse the species restriction in that the generic claims are allowable. For the reasons set forth below, the generic claims are not allowable.

#### ***Status of Claims***

Claims 30-33 and 38-82 are pending.

Claims 30-31, 38-41, 43, 47-48, 51-54, 56-59 and 68 are withdrawn from consideration as being drawn to non-elected invention and species.

Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82 are under examination.

#### ***Withdrawn Rejections***

In view of applicants' arguments the 35 USC 101 rejection for lack of specific utility has been withdrawn.

#### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82, as amended and added, are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Applicants state "...many different natural glycopeptides are known in the art. Of course, the starting peptide must feature at least one glycosylation site....." Also, see applicants' statement in the last Remarks which states that "...the beauty of a combinatorial process is that it generates all permutations automatically..." See further the discussion in the Background of the Invention at page 1 of the instant specification. Vetter (WO 95/18971) states at page 2, line 4-35, "glycopeptides consist of oligosaccharide units attached to a polyamide core via glycosidic bonds. The oligosaccharide chains vary in size from one to thirty to more units..... up to eight hundred sugar side chains....." In view of the numerous statements above, the instant library would read on the naturally occurring glycopeptides. The natural glycopeptides normally contain numerous variations that form a million components as the instant claimed library.

***Claim Rejections - 35 USC § 112, first paragraph***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear,

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concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

***New Matter Rejection***

The as-filed specification does not provide support for the following newly added claimed limitations:

1. A "plurality" of different glycopeptides; "one or more component carbohydrate structures"; "where at least one of the following conditions applies"; "unglycosylated peptide" (Claim 45).
2. A "plurality" of different glycopeptides; "one or more component carbohydrate structures" (claim 49).
3. Claim 62, product-by-process claim.
4. Claim 64 and 65 "is derived".
5. Claims 73 and 74, "collectively".
6. The entire claim 76.

7. A "plurality" of different glycopeptides recited in claims 78-81. Also the claimed "with respect to the point of attachment" in e.g., claim 78. Note that claim 78 is cited only as an example. Claims 79-81 also recite said "with respect" to different concepts.

8. "The order of attachment" in claim 82.

MPEP 714.02 states that applicants clearly point out where the new claim limitations are supported specifically in the specification. Absent statement for said support, the above-claimed new limitations constitute new matter.

#### ***Written Description***

Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82, as amended and added, are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for reasons set forth in the last Office actions.

#### ***Response to Arguments***

Applicants state that claim 32 requires that for a given library, all of the (glycopeptides have the same peptide scaffold. The only variation, consequently, is with regard to

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which carbohydrate structures are attached to that scaffold and where. Moreover, the choice of scaffold (core peptide) limits the possible location of the carbohydrate structures, as they must have been attached as a result of glycosylation of a glycosylation site (i.e., Ser, Thr, Asn, Gln in the case of a genetically encoded peptide) of the starting peptide.

In response, the claims e.g., claim 45 does not describe the argued glycosylation site e.g., Thr for the starting core peptide. Rather only that the peptide scaffold comprises at least a four amino acid subsequence of the core protein of MUC1 which contains a glycosylation site. It is not apparent from the claimed library described merely in words, instead of its structure, the kind or type of library being claimed. The disclosure describes a single core, i.e., a structurally defined peptide with a specifically defined glycosyl compound that form a defined compound library of the structure as in Fig. 4. There is no correlation of the single species to the claimed genus of no definite structure. Compounds are normally described in terms of its structure that distinguish them from other compounds and thus fully characterizing said compounds.

It is applicants' opinion that the library members do not have to actually offer the desired function merely be screenable for it.



In reply, a compound fingerprinted by its structure and its function is inseparable. How can a compound with no defined structure be screenable? As such every conceivable linkage with e.g., glycosyl can occur. This may likely result in a different library rather than the desired one. A peptide sequence which contains numerous, unique amino acids are known to interact with one another, let alone in the presence of glycosyl. The specification does not describe a library of no definite structure, as the genus claimed library. Rather, the detailed description in the specification is drawn to a species that results in a library of defined structure that enables its screening. Thus, at the time of applicants' invention, the specification does not describe the genus as claimed with no defined structure. There is no correlation made in the specification of the single species to the huge scope of the genus claimed library. As applicants state in their instant REMARKS, "...the component carbohydrate structures (i.e., the individual sugars) forming the carbohydrates receptors for bacterial adhesins are, not surprisingly, the same as those which are incorporated into cancer-associated mucins...." ). In biotechnological invention one cannot necessarily claim a genus after only describing a single species because there may be unpredictability in the results obtained from species other than

those specifically described. The more unpredictable the art the greater the showing required (e.g. by (representative examples) adequate disclosure.

Applicants remind the examiner that Appendices 1 and 2 demonstrate the general acceptance of combinatorial library claims as satisfying description even though there is a random component.

In response, applicants are also reminded that it is well settled that each case is treated on its own merits. The fact situation in each case is different.

#### ***Enablement (Scope) Rejection***

Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82, as amended and added, are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for mucin 1 (MUC1) as the core protein and inhibitory activity for a compound in the library, does not reasonably provide enablement for the broadly recited library of glycopeptides for reasons of record.

#### ***Response to Arguments***

Applicants state that the specification clearly contemplates use of platforms other than MUCI. Peptides, and in particular the core proteins of cancer associated mucins, are of particular interest (P1, L9-13). Applicants state there is no

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reason to believe that other peptides would be more difficult to randomly glycosylate than would MUCI. Platforms are discussed further at P5, L30-P7, L11. The specification says that the platform can be a peptide and, if so, that may be linear or cyclic. It is also clear that the peptide may be composed of l- or d-amino acids. Reference made to hydrophobic amino acids at P6, L35-37, and to glycosylatable amino acids at P1, L21-28. Several specific platforms other than MUCI are disclosed. The first is Tn antigen. Since Tn antigen is GalNAc-o-serine, the platform is just Ser per se. TF antigen has the same platform (P7, L30-34).

In response, this is not controverted. What is at issue is the huge scope of genus claim. The generic library recites a core peptide structure of at least four amino acids and a carbohydrate structure associated with a human cancer-associated mucin. It does not recite in what sense the structure of the carbohydrate is in association with cancer-associated mucin. It is not apparent as to the kind of cancer, let alone, its structure that is associated with mucin. The genus claim does not recite any structure consequently; it is hard to establish its synthesis and the kind of peptide library, as claimed. It is well known in the art that oligosaccharides, let alone, carbohydrates are very complex and diverse. The issues of

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stereochemistry at the anomeric position and the multiple hydroxyl groups present complicate it. Applicants' general statement in the specification and arguments cannot substitute for an enabling disclosure for a genus as broadly claimed. As applicants acknowledge the specification describes a species of the library of core peptide from mucin glycosylated with a specific glycosyls at specific sites of the core peptide. See further applicants' statements in the previous REMARKS that a hit may not be produced from a large library. Also see applicants' Remarks at paragraph bridging pages 8 and 9 of the previous REMARKS. Attention is drawn to Garg et al (Advanced in Carbohydrate Chemistry and biochemistry) specifically at page 278 or Arya (Angew. Chem. Int. Ed. Eng.), particularly at page 1280, col. 2.

### ***Claim Objections***

Claim 46 is objected to because there is no claim identifier for said claim (e.g., new). Appropriate correction is required.

***Claim Rejections - 35 USC § 112, second paragraph***

Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82, as amended and added, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claim 45, for example, is indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim. For example, it is not clear as to the plurality of the different glycopeptides and its variations with regard to the carbohydrate structures. The carbohydrate structure association with a human cancer-**associated** mucin, the different recited conditions and the optional peptide scaffold as an unglycosylated peptide.

B. Claim 46 is unclear as to its scope especially since the limitation already appears in the base claim 45.

C. Claim 60 and 61 are unclear as to the number of different peptides(include glycopeptides?) as at least 9 or at least 39. Is there e.g., at least 39 different peptide scaffolds?

D. Claim 62 is unclear as to the description of the product by its process especially, when the process recites terms that are not found in the product claim, e.g., a first level library.

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It is not clear whether the library as claimed is the library that resulted from the process. It would appear that the process steps results in a different type of glycopeptide library.

E. Claims 64 and 65 is unclear as to how the peptide scaffold is "derived" from a cancer-**associated mucin**.

F. Claims 73 and 74 are unclear as to the "at least three different monosaccharides" found, "collectively" among the monosaccharide directly attached to at least one glycosylation site. Is a library product or a process intended by the claim? "Monosaccharide" is inconsistent with claim 32, from which it depends, recitation of a carbohydrate.

G. Claim 76 is unclear as to the definition for the variable n. Its reference to claim 70 is unclear as it does not recite any integer.

H. Claim 78 is unclear as to the limitation "vary with respect to the point of attachment" of said carbohydrate structure. It is not clear in what respect the variation, as to the point of attachment, is made. This rejection has similar import to claims 79-82 and 32, especially in the absence of positive support in the as-filed specification.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 32-33, 42, 44-46, 49-50, 55, 60-67 and 69-82, as amended and added, are rejected under 35 U.S.C. 103 as being obvious over Vetter et al (WO 95/18971) in view Ding et al (Cancer Immunology Immunotherapy).

Vetter discloses at page 25, line 33 up to page 27, line 10 a glycopeptide library of structure Ac-X-X-E (OA)XP-resin, X is any of the 18 side chain protected amino acids as recited therein. Vetter discloses a library of glycoconjugates diversified with 17 different glycosylamines e.g., Gal Nac. See further page 5, summary up to page 7, line 27 and the Examples at pages 38-56.

Vetter does not disclose that the carbohydrate structures is associated with a human cancer-associated Mucin or MUC1, core peptide as claimed. Ding discloses a glycopeptide MUC1 at page 11, Fig. 1 with the sequence as shown therein. Ding further discloses at page 15 that the core peptide of MUC1 was chosen

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because of its strong association with human breast cancer and the fact that core peptide cryptic epitopes are revealed in cancer cells as a result of under glycosylation of mucin in carcinoma cells. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use MUCI as the core peptide in the library of Vetter as taught by Ding. The advantages in using Mucin as the glycopeptide as taught Ding, above would provide the motivation to one having ordinary skill in the art at the time of the invention.

Applicants' arguments with respect to the prior art cited in the last Office action e.g., Rao is moot in view of the new grounds of rejection above.

The copies of references cited in 892 have not been included since copies have been provided in the parent application, 09/842,873.

No claim is allowed.

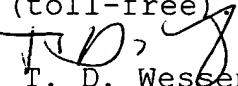
Any inquiry concerning this communication or earlier communications from the examiner should be directed to T. D. Wessendorf whose telephone number is (571) 272-0812. The examiner can normally be reached on Flexitime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Paras can be reached on (571) 272-4517. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
T. D. Wessendorf  
Primary Examiner  
Art Unit 1639

Tdw

August 21, 2006